

## Local Conformation of Polystyrene In Films At Interface With Inorganic Substrates

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Recently, glass transition behavior of polymers in confined systems such as at surfaces and interfaces has been studied with the advent of modern experimental techniques.<sup>1)</sup> However, conformation of polymers at surfaces and interfaces has been deduced only on the basis of computer simulation. In this study, we apply sum-frequency generation (SFG) spectroscopy to discuss local conformation of polystyrene (PS) at solid interfaces. As samples, monodisperse PS and deuterated PS (dPS) were used. Films of PS and dPS were prepared on hydrophilic quartz prisms by a solvent cast method. Local conformation of PS and dPS at quartz interface was examined by SFG spectroscopy for *ssp* (*s*-polarized SF output, *s*-polarized visible input, *p*-polarized infrared input) polarization combination. Figure 1 shows SFG *ssp* spectra in the C-H region for PS and dPS films sandwiched between hydrophilic quartz substrates. Even in the case of dPS, SFG peaks were observed. Since C-H bonds are only in chain ends *sec*-Bu groups, it is clear that chain ends were segregated at the quartz interface. Combining the intensity ratios of *ssp* and *ppp* peaks with simulation results, it was concluded that the chain ends were oriented along the direction parallel to the interface.

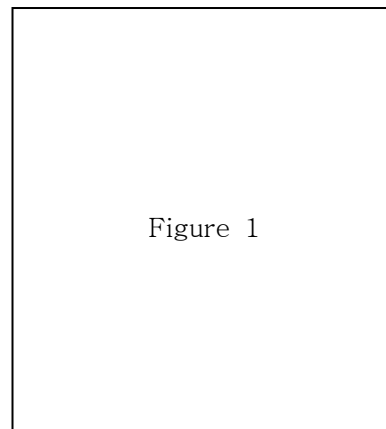


Figure 1

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